18. (a) Construct the ESR of transition metal complexes of vanadyl complexes.

(b) Discuss the fine structure in PES With examples.

19. (a) Elaborate about the instrumentation of GLC.

(b) Formulate the working of HPLC.

20. (a) Describe the determination of magnetic susceptibility by faraday.

(b) Compose the working of droping mercury electrode.

APRIL/MAY 2024

DECH43A/GECH43A — INORGANIC CHEMISTRY – IV

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What is the objective of UV spectroscopy?

2. Which molecule will not display an infrared spectrum?

3. Why iron is used in Mössbauer spectroscopy?

4. Give the type of nuclei is suitable for NQR spectroscopy.

5. Mention the McConnell equation for ESR spectroscopy.

6. Show the limitations of photoelectron spectroscopy.

7. Select the pollutants are analysed by ICP?

8. List the applications of AFS.

9. Is a Gouy balance used to determine the magnetic susceptibility of a substance? Why?

10. Tell the basic principle of amperometry.

PART B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Why laser is used in Raman spectroscopy?

Or

(b) (i) What is the visible spectrum? (1)

(ii) Evaluate the band of colour with the longest range of wavelengths. (2)

(iii) Mention the band of colour with the shortest range of wavelengths. (2)

12. (a) What are the chemical shifts of ^{31}p? Explain.

Or

(b) Select the NMR shift reagents.

13. (a) What is meant by hyperfine structure of spectral lines? How could it be explained based on nuclear spin?

Or

(b) Discuss the Koopmans theorem in PES.

14. (a) Conclude the major HPLC components and their functions.

Or

(b) Develop the advantages of AAS with examples.

15. (a) Summarize the amperometry principle and its applications.

Or

(b) What is the principle of laser Raman spectroscopy? Mention its applications.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. (a) List the application of IR spectroscopy in inorganic compounds.

(b) Explain the Raman spectra of metal complexes.

17. (a) Compile the difference between NQR and NMR.

(b) Evaluate the MB spectrum of sodium nitro prusside.